

REMARKS

This responds to the Advisory Action mailed on September 29, 2005, and to the Office Action mailed on July 11, 2005.

No claims are amended, no claims are canceled, and claims 60-64 are added; as a result, claims 1-64 are now pending in this application. Applicant respectfully requests reconsideration of the above-identified application in view of the remarks that follow.

Comments on Advisory Action

In the Advisory Statement mailed 29 September 2005, it is stated that the "Examiner agrees that in Table 1 and Fig. 3 between the cluster size of 3 and about 23 the electron affinity increases, but above a cluster size of 23 the electron affinity levels off at about a value of 2.8 eV. Absent any evidence to the contrary, the Examiner finds that the value of 2.8eV would be the electron affinity for even larger quantities of aluminum." Applicant submits that no objective evidence or reference is provided in the Office Actions of record to support the quoted proposition. The cited reference, Taylor, is absent data regarding electron affinities for clusters greater than 32 atoms. However, in curve fitting the data, Taylor shows in Figure 3 a positive slope of the curve at the 32 atom data point, indicating increasing value of the electron affinity for clusters of more than 32 atoms. Therefore, Taylor is at least ambiguous with respect to the above quote from the Advisory Action. Thus, Applicant respectfully submits that the rejections of the claims made in the Office Action, mailed 11 July 2005, and maintained in the subsequent Advisory Action are improper.

Further, as is known by those skilled in the art, for a metal, the difference between the vacuum level and the Fermi energy is the work function of the metal. As illustrated in Figure 3 of the specification, the electron affinity may be taken to be the energy difference between the vacuum and the conduction band edge at a surface. (*See Pierret page 23, lines 9-13*). Applicant submits that an appropriate value for an electron affinity associated with aluminum, which is a metal, is about the value of its work function. The electron affinity of silicon is about 4.2 eV as noted in the specification, for example, on page 13, line 4. The work function for aluminum is about 4.09eV (*See Pierret page 63, Table 4.1, and Michaelson, Tables II and III*). Applicant submits that a value of an electron affinity associated with aluminum in a metal oxide

semiconductor structure, as depicted in Pierret (Pierret and Michaelson enclosed with this response), is around a value of 4.1 eV rather than 2.8 eV as proposed in the Office Action.

§102 Rejection of the Claims

Claims 1, 3-5, 11, 12, 14-16, 18, 19, 21, 22, 24, 25, 28, 30, 31, 33, 34, 36, 52, and 54-56 were rejected under 35 U.S.C. § 102(b) as being anticipation by Lohstroh et al. (U.S. 4,019,197). Applicant traverses these grounds for rejection of these claims.

Applicant cannot find in Lohstroh et al. (hereafter Lohstroh) a disclosure, a teaching, or a suggestion of a storage electrode having an electron affinity less than 3.7 eV as recited in claim 1. In the Office Action, it is stated that “Lohstroh illustrates ... a floating gate (storage electrode) 4 of aluminum, which has an electron affinity of about 2.8 eV*.” In the Office Action, it is further stated that “[t]he value of the electron affinity of aluminum is based on ‘UPS of Negative Aluminum Clusters’ by Taylor et al.” Applicant respectfully disagrees with this analysis in the Office Action. Taylor relates to studies of negative aluminum clusters, in which Taylor discusses an electron affinity for aluminum clusters having at most 32 aluminum atoms. The electron affinity of 2.8 eV is associated with clusters of 26 electron atoms, 28 electron atoms, 30 electron atoms, and 31 electron atoms. *See Table 1 of Taylor*. Further, Figure 3 of Taylor shows that as the number of aluminum atoms increases in a cluster, the associated electron affinity increases. Applicant submits that the electron affinities identified in Taylor are those for an aluminum cluster having at most 32 atoms and does not provide an electron affinity for the aluminum layer 4 of Lohstroh. Applicant cannot find in Lohstroh a disclosure, a teaching, or a suggestion of an aluminum layer as a floating gate in a transistor that may be realized by a negative aluminum cluster having at most 32 atoms. As a result, Applicant submits that neither a reference nor objective evidence has been provided in the Office Action that discloses, teaches, or suggests that Lohstroh’s aluminum layer has an electron affinity less than 3.7 eV. Therefore, Applicant submits that Lohstroh does not teach the identical invention in as complete detail as is contained in claim 1 and that Lohstroh does not anticipate claim 1. Thus, Applicant submits that claim 1 is patentable over Lohstroh for at least the reasons stated above.

For at least reasons similar to the reasons discussed above with respect to claim 1, Applicant submits that independent claims 12, 22, 31, and 52 are patentable over Lohstroh.

Additionally, claims that depend on independent claims 1, 12, 22, 31, and 52 are patentable over Lohstroh for at least the reasons stated herein.

Applicant respectfully requests withdrawal of these rejections of claims 1, 3-5, 11, 12, 14-16, 18, 19, 21, 22, 24, 25, 28, 30, 31, 33, 34, 36, 52, and 54-56, and reconsideration and allowance of these claims.

First §103 Rejection of the Claims

Claims 6-10, 17, 20, 26, 27, 29, and 35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Lohstroh et al. (U.S. 4,019,197). Applicant traverses these grounds for rejection of these claims.

Claims 6-10, claims 17 and 20, claims 26, 27, and 29, and claim 35 depend on patentable claims 1, 12, 22, and 31 and are patentable over Lohstroh for at least the reasons stated above with respect to claim 1.

Applicant respectfully requests withdrawal of these rejections of claims 6-10, 17, 20, 26, 27, 29, and 35, and reconsideration and allowance of these claims.

Second §103 Rejection of the Claims

Claims 2, 13, 23, 32, and 53 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Lohstroh et al. (U.S. 4,019,197) in view of Wakai et al. (U.S. 5,032,883). Applicant traverses these grounds for rejection of these claims.

Applicant submits that Wakai et al. (hereafter Wakai) does not cure the deficiencies of applying Lohstroh with respect to independent claims 1, 12, 22, 31, and 52. Therefore, Applicant submits that independent claims 1, 12, 22, 31, and 52 are patentable over Lohstroh in view of Wakai. Claim 2, claim 13, claim 23, claim 32, and claim 53 depend on patentable claims 1, 12, 22, 31, and 52, respectively, and are patentable over Lohstroh for at least the reasons stated above with respect to these independent claims.

Applicant respectfully requests withdrawal of these rejections of claims 2, 13, 23, 32, and 53, and reconsideration and allowance of these claims.

Claim Objections

Claims 57-59 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant traverses these grounds for objection of these claims.

Applicant submits that claim 57 is dependent on patentable claim 52 and is therefore patentable.

Applicant notes that claims 58-59 were rewritten in independent form including all of the limitations of the base claim and any intervening claims in the response filed 27 April 2005 in reply to the Office Action mailed 3 February 2005. Therefore, the objection in the current Office Action is at least ambiguous, if not moot. Thus, Applicant requests the removal of the finality of the Office Action. Further, Applicant submits that the instant claims 59-59 are patentable.

Applicant respectfully requests withdrawal of these objections of claims 57-59, and reconsideration and allowance of these claims.

Allowable Subject Matter

Claims 37-51 were allowed. Applicant acknowledges allowance of claims 37-51.

New Claims

Claims 60-64 were added. Claims 60-64 dependent on patentable claims 1, 12, 22, 31 and 52, respectively. Support for these claims may be found in the specification, for example, on page 26, lines 10-13, since silicon oxycarbide is a non-metal.

Applicant respectfully requests consideration and allowance of claims 60-64.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (612) 371-2157 to facilitate prosecution of this application.


If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

LEONARD FORBES ET AL.

By their Representatives,

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Date 11 October 2005 By 
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop RCE, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 11 day of October, 2005.

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